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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,427

04/20/2007

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EXAMINER

KALAFUT, STEPHEN J

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,427	<b>Applicant(s)</b> PETERSEN ET AL.	
	<b>Examiner</b> Stephen J. Kalafut	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> .                                  | 6) <input type="checkbox"/> Other: ____.                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :20 Apr 2006, 23 June 2006, 02 Aug 2006, 20 Apr 2007, 08 Aug 2008.

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Claims 21-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “approximately”, appended to various amounts, would render them indefinite, because how far away from the stated value an amount may be, while still being “approximately” that value, is not numerically specified. The term “generally spherical” is likewise unclear, as to how far from a sphere a shape may be, while still meeting this term.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-23, 29, 42 and 43 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Klein *et al.* (US 2004/0121233), cited by applicants.

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Klein *et al.* disclose a positive active paste for a lead-acid battery, which is provided onto a battery grid, and which includes tetrabasic lead sulfate (paragraph 0008). The diameter of the tetrabasic lead sulfate particles is less than about 3 microns (paragraph 0012), more specifically 1.5 microns or less (paragraph 0013), and may be have their size reduced by milling, before they are mixed into the paste (paragraphs 0018 and 0020). This would be within the recited ranges of “less than approximately 2.5 micrometers”, “less than approximately 2 micrometers” and “between approximately 1 and 2 micrometers”, to the extent that they are understood. Since the particles are milled, they would exhibit a “generally spherical shape”, to the extent that the term is understood. Because the size of the particles would have an effect on their surface area and thus the kinetics of the reaction in which they take part, determining an optimal particle size would be within the skill of the artisan. For this reason, these claims, if not anticipated by Klein *et al.*, would be at best be obvious thereover.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein *et al.*

This claim differs from Klein *et al.* by reciting the amount of tetrabasic lead sulfate within the paste. However, because this component has an effect on the pore volume and in turn the electrical performance (paragraph 0024), determining an optimal amount be within the skill of the artisan. For this reason, this claim would be obvious over Klein *et al.*

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein *et al.* in view of Sugahara *et al.* (US 4,329,182).

These claims differ from Klein *et al.* by reciting a jet milling process for milling the tetrabasic lead sulfate. Sugahara *et al.* teaches a jet mill as useful for pulverizing polybasic lead sulfates. Because the tetrabasic form is one type of polybasic lead sulfate, it would be obvious to use the jet milling process of Sugahara *et al.* to mill the tetrabasic lead sulfate of Klein *et al.*

Claims 31, 33-35 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klein *et al.* in view of Kao *et al.* (US 5,302,476), cited by applicants.

These claims differ from Klein *et al.* by reciting leady oxide as a component of the paste, into which the tetrabasic lead sulfate is mixed. Kao *et al.* disclose a positive electrode mixture for a lead acid battery, which includes a lead sulfate and a lead oxide (column 4, lines 12-18), such as tetrabasic lead sulfate (column 4, lines 28-31) and a leady oxide (column 4, lines 66-68). Because of the high performance provided by this type of mixture (column 3, lines 49-64), it would be obvious to use the leady oxide of Kao *et al.* with the tetrabasic lead sulfate of Klein *et al.* Kao *et al.* also gives guideline for the relative amounts of the two components (column 4, lines 14-15). Determining an optimal mixing temperature would also be within the skill of the artisan, familiar with the thermal effects of mixing substances.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klein *et al.* in view of Chen *et al.* (US 6,755,874), cited by applicants.

This claim is in product-by-process format, and is thus examined for the characteristics of the product. The process steps are not given weight, until they are shown to necessarily convey characteristics to the recited product that are not found in the prior art. See MPEP 2113 and the

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cases cited therein. This claim differs from Klein *et al.*, in terms of its product limitations, by reciting that the tetrabasic lead sulfate forms crystals with a thickness of “between approximately 2 and 5 micrometers”. Chen *et al.* disclose an active mixture that includes tetrabasic lead sulfate, that for “optimum battery performance” forms crystals with an average width of between 2 and 4 micrometers (column 6, lines 33-35). Because this is the same substance as disclosed by Klein *et al.*, it would also provide optimal performance in this same size range. Thus, it would be obvious to for the tetrabasic lead sulfate of Klein *et al.* into crystals with an average width (*i.e.*, thickness) of between 2 and 4 micrometers as taught by Chen *et al.*

Claims 24-27 and 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not disclose a method of making a battery plate in which a paste of tetrabasic lead sulfate is cured at less than 48 °C. Instead, the curing temperatures of the prior art are higher.

Claims 36-41 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. These claims also recite making a battery plate in which a paste of tetrabasic lead sulfate is cured at less than 48 °C, incorporating this step in to a process of making a battery.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chubb *et al.* (US 2,479,603) disclose a battery paste comprising  $4\text{PbSO}_4 \cdot \text{PbO}$ , a basic

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lead sulfate in which is the amounts of sulfate and oxide ions are reversed from those of tetrabasic lead sulfate ( $\text{PbSO}_4 \cdot 4\text{PbO}$ ). Chen *et al.* (US 6,617,071) disclose a lead electrode in which tetrabasic lead sulfate particles are adhered to a polymer matrix.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Stephen J. Kalafut/  
Primary Examiner, Art Unit 1795